

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
4 August 2005 (04.08.2005)

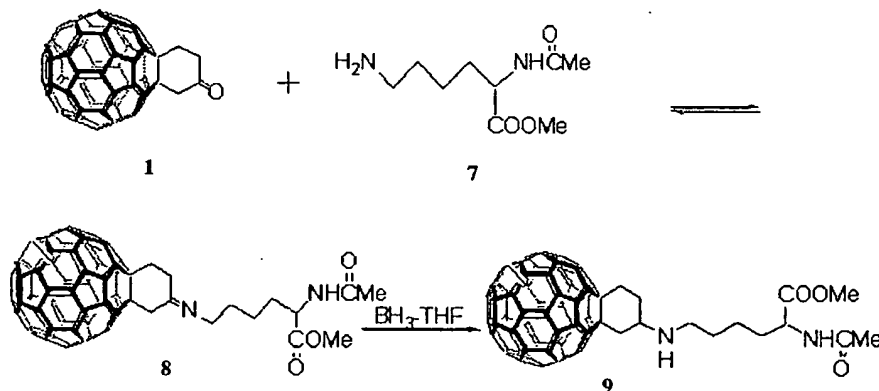
PCT

(10) International Publication Number  
WO 2005/070827 A2

- (51) International Patent Classification<sup>7</sup>: C01B 31/02, A61K 31/185
- (21) International Application Number: PCT/US2005/001187
- (22) International Filing Date: 14 January 2005 (14.01.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/536,544 14 January 2004 (14.01.2004) US
- (71) Applicant (for all designated States except US): WILLIAM MARSH RICE UNIVERSITY [US/US]; 6100 Main Street, Houston, TX 77005 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): BARRON, Andrew, R. [GB/US]; 241 Asbury, Houston, TX 77007 (US). YANG, Jianzhong [CN/US]; 2209 S. Braeswood, No. 31J, Houston, TX 77030 (US).
- (74) Agents: GARSSON, Ross, Spencer et al.; Winstead Sechrest & Minick P.C., P.O. Box 50784, Dallas, TX 75201 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: FULLERENE BASED AMINO ACIDS



Scheme 3

(57) Abstract: The present invention is directed to a series of new compounds, combining the unique properties of fullerenes and bio-active amino acid residues, and to methods for making such compounds. The present invention is directed toward fullerene-based amino acids, and to amino acid residues, peptide chains, proteins, and polypeptides made from such fullerene-based amino acids. The present invention is further directed to amino acid residues, peptide chains, proteins, and polypeptides comprising such fullerene-based amino acids and into which such fullerene-based amino acids have been incorporated. Exemplary compounds have been prepared, and these compounds have been characterized and confirmed with infrared (IR) spectroscopy, nuclear magnetic resonance (NMR) spectroscopy, mass spectrometry (MS), etc. These new compounds, which are additions to the existing amino acid residue family, may potentially possess useful pharmaceutical application and may provide a new platform for further exploration in cancer therapy, and peptide and protein engineering.



**Declaration under Rule 4.17:**

- of inventorship (Rule 4.17(iv)) for US only

**Published:**

- without international search report and to be republished upon receipt of that report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*